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NOTES

THE TIME ELEMENT IN LABOR TURNOVER COMPUTATION

In the discussions of labor problems, there has developed a difference of opinion as to the best method of measuring labor turnover. Briefly, there have been two distinct theories advanced. One group of economic students advocates that one can best gauge labor turnover by using separations (total number of employees that are taken off the pay-roll), and the other group advocates the measurement of this phenomenon by using replacements (total number of men hired to replace those who have recently left). Which of the two is the better method depends entirely upon the purpose of the final figure. The one method, that of separations, measures the instability of employment; the other, that of replacements, tends to measure the instability of employees. Instability of workmen consists of the discharges and voluntary withdrawals due to poor methods of selection, low wages, long hours, poor conditions of work, etc. Instability of employment includes, however, not only the instability of men but also the instability of jobs which is due (*a*) to seasonal and cyclical fluctuations and (*b*) to changes in processes or methods of production. The hirings and separations which are due to the creation or extinction of jobs caused by changes in the methods of production are rather few in number in the ordinary business, and, therefore, they will not be considered in this paper. In the discussion below, replacements will be considered as equal to separations in a period of increasing working force and to hirings when the force is being decreased.

To illustrate how the labor turnover figures would differ by using the two different methods, take the example on page 829.

This table shows that when the working force is constant or increasing there is no difference between the labor turnover figures. In a period, however, when the force is decreasing there is a considerable difference in the net result. This is due, as has

been explained above, to the fact that when one uses separations as a basis for computation, one includes beside replacements the net decrease in the level of the working force due to industrial conditions which make it less expensive for a plant to operate part of its machinery than it is to operate all of it and employ a full quota of workmen.

No. on Pay-Roll at Different Dates	Average Pay-Roll	Hired	Fired	Turnover Figure. Separations	Turn-over Percentage	Turnover Figure. Replacements	Turnover Percentage
				Av. Pay-Roll		Av. Pay-Roll	
Dec. 1—100	100	5	5	$\frac{5}{100}$	5	$\frac{5}{100}$	5
Jan. 1—100							
Jan. 1—100	90	5	15	$\frac{15}{90}$	16 $\frac{2}{3}$	$\frac{5}{90}$	5.5
Feb. 1—80							
Feb. 1—80	100	45	5	$\frac{5}{100}$	5	$\frac{5}{100}$	5
Mar. 1—120							

From a "general interest" long-run point of view the separation's method is sufficient. A figure that will measure the instability of employment is the one that is desired. On the other hand, from the point of view of the business manager, the method which will resolve the problem into its constituent parts is the better one. The causes and the accompanying costs of separations which are due to the necessity of reducing a working force should not be confused with the causes and costs of separations which arise out of inefficiency or voluntary withdrawals of workmen.

Therefore, if the object is to arrive at a turnover figure which will offer a measurement of the instability of employees, that is, separations due only to inefficiency or voluntary withdrawals, the replacement theory should be used.

The use of this method presents a problem which thus far has not received adequate attention, namely, the length of the period which should be used as a basis for computation. The importance of this question becomes apparent when one realizes that the total replacements in a given plant will tend to approach the total separations in that plant as the period which is used for the computation is increased in length. In fact, if one should use as long a period as a complete business cycle in a plant which is not losing ground, the replacements and separations would tend to equal each other, because all "postponed" replacements would be taken care of.

Therefore, if the replacement theory is to be used with any degree of consistency, one must consider very carefully the period over which the labor turnover computation is to be made. How short or how long should this period be? Several of the proponents of the replacement theory have advocated the year as the smallest unit of time to be used in order to take care of some "postponed" replacements. This period, however, is unsatisfactory because it has a tendency to measure the instability of jobs caused by seasonal fluctuations that occur in most industries during a year.

To illustrate, let us take the following hypothetical example, assuming that the constantly decreasing labor force during the first half of the year and the constantly increasing force during the last part of the year are due only to seasonal fluctuations, and that there is a decrease of a permanent nature in the labor force.

Average Number on Pay-Roll	Hirings	Separations	Replacements
Pay-roll at the beginning..... 1,000			
Jan. 1-Feb. 1..... 990	0	10	0
Feb. 1-March 1..... 980	0	10	0
March 1-April 1..... 965	0	15	0
April 1-May 1..... 950	0	15	0
May 1-June 1..... 925	0	25	0
June 1-July 1..... 915	0	10	0
July 1-Aug. 1..... 925	10	0	0
Aug. 1-Sept. 1..... 935	10	0	0
Sept. 1-Oct. 1..... 945	10	0	0
Oct. 1-Nov. 1..... 955	10	0	0
Nov. 1-Dec. 1..... 965	10	0	0
Dec. 1-Jan. 1..... 975	10	0	0
Pay-roll at the end..... 975			
Total.....	60	85	0

If the year is used as a period for computation the replacements are sixty, because in a decreasing force the hirings are equal to the replacements. Yet as a matter of fact, all workmen have left because of the instability of jobs, and there were no replacements due to instability of men. If the month were used as the smallest unit, there would be no replacements for the year and the total turnover figure for all the months in the year would be zero, the correct measurement of turnover due to the instability of men.

Thus, the turnover figure computed by using the total replacement of the year not only measures instability of men but also

instability of jobs due to seasonal fluctuations. And, therefore, it is as inadequate in essence as a turnover figure calculated by using separations. The instability of men caused by seasonal fluctuations is an entirely different problem from the instability of men caused by poor working conditions, low wages, long hours, poor methods of selection, etc., and, should be considered and remedied separately.

The shorter the period of computation the more accurately the instability of men will be measured. There are, however, two limitations to this advantage in decreasing the length of the period of computation. The smaller the period gets the more costly it will become to measure the replacements. It is very much more costly to compute turnover figures each week than it is each month. Besides this practical limitation, there is another which is of more importance. The shorter the unit of computation, the greater is the danger of not including replacements which take place as a result of instability of men. For example, when the week is used as the period of computation men who left on Saturday and were replaced on Monday will appear as separations only and will be measured as "changes in level." As a matter of fact, however, they may be as much replacements as those that left on Monday and were replaced on Wednesday during the week.

The exact length of a period of computation which most accurately measures the instability of men depends entirely upon the influence of the two limiting factors mentioned above. If a plant finds it practical to calculate replacements every month, the turnover figure for the year should be found by adding the twelve turnover figures rather than by using the year as a basis. An objection to the use of the month is present only if a great many men are discharged during the last week of every month and are replaced during the first week of the following month. This practice, however, is not prevalent in the typical business and, therefore, the danger of measuring replacements inaccurately when the month is used as a period of computation is very slight. In a plant where it is found practical to calculate a turnover figure for every week, this danger may be so increased that a longer period may have to be used in computing the turnover more accurately. In the ordinary business, however, it is impractical to calculate a turnover figure more often than once a month.

Hence, to the great majority of business managers who are facing the labor turnover problem, the most adequate labor turnover figure will be found by using replacements computed on the basis of monthly periods. A shorter period is likely to result in an inaccurate measurement of replacements, and a longer period is likely to become inaccurate because of the increased danger of measuring the instability of jobs due to seasonal and cyclical fluctuations. Of course, in certain cases because of extraordinary conditions, it may be more advisable from the point of view of accuracy, to use some period other than a month as the unit of computation.

In conclusion, the problem of deciding which *period* will result in a labor turnover figure that will most accurately measure the instability of men is one that needs a great deal of careful attention. When separations are used, the length of the computation period does not affect the accuracy of the final turnover figure. The instability of employment is measured and both the "change in level" of a given labor force and the instability of men is taken into consideration. But as soon as the problem is resolved into its constituent parts and only a turnover figure which will measure most accurately the instability of men is required, the length of the period of computation becomes an extremely important factor. The use of an inaccurate period of computation will counteract to a large extent the advantage gained by the use of replacements instead of separations, that is, differentiating between the turnover which is due to the instability of men and that which is due to the instability of jobs. In industrial periods of contraction, like the present, however, the replacement theory based on any period of computation is better than the separations theory. The turnover figure which is computed by using replacements differentiates to some extent the labor turnover problem caused by a "change in level" of a given force from the turnover problem caused by voluntary withdrawals and discharges due to inefficiency of workmen. The extent to which these problems are separated from each other depends on the length of the computation period used. The longer the period used the more will the turnover figure calculated tend to measure instability of jobs as well as of men.